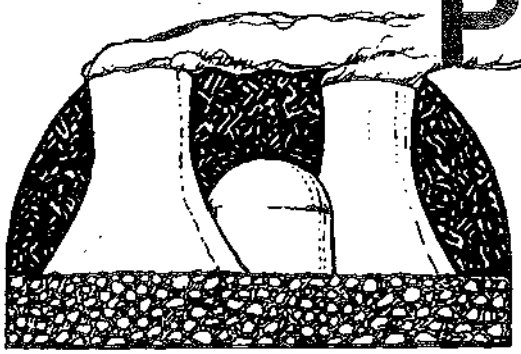
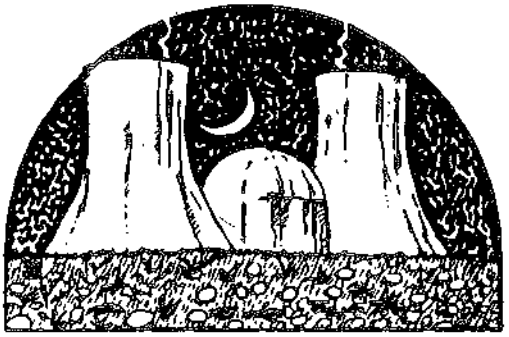
IV CONFERÈNCIA CATALANA PER UN FUTUR SENSE NUCLEARS





- ACCIDENTS NUCLEARS
- LA TECNOLOGIA NUCLEAR, NATURA I SOCIETAT

Auditori del Centre Cultural
Plaça de Sant Jaume
Jaume I, 2 Barcelona
Dia 25 d'abril de 1990
a les 18,45 h.

Organització: Grup de Científics i Tècnics per un Futur No Nuclear. Apartat de Correus 10095: 08080 Barcelona

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Synopsis of Lecture given by Richard E. Webb at the AAI Conference, Session on "Reactor Unsafety" (September 24, 1986, Vienna), on the Theme:

Chernobyl and the Accident Hazards of Western Reactors

The Chernobyl nuclear accident is a public health and environmental catastrophe for Europe due to the radiation release and fallout. The full dimensions have not been determined or revealed by government authorities. An estimated 600,000 square kilometers of land have been seriously contaminated, resulting in prospective radiation doses from the nuclear fallout, contaminated food, and other forms of radiation exposure which are substantial relative to the natural radiation to which humans are exposed. The possibility of 720,000 (seven hundred thousand) or more cancer deaths cannot be excluded. Thorough radiation measurements of the land and stringent radiation protection measures are urged, to minimize the further exposure of the European population to the radiation from the Chernobyl fallout.

The Chernobyl reactor eruption was caused by a runaway atomic reaction. Fortunately, only a small fraction of the radioactivity in the reactor was released into the atmosphere---2% to 7% by my calculations, and 3.5% by the Soviet's analysis. The runaway reaction and other processes of the reactor eruption, as well as the weather-fallout conditions, could have been worse. Quantitatively, the accident could have been 500 times worse in terms of the radioactive release and fallout levels, particularly the gamma radiation by the fallout contamination, the cesium food contamination, and the strontium-90 and plutonium contaminations. More specifically, there could have occurred

a near full release of radioactivity from the Unit 4 reactor, which erupted at Chernobyl, plus (potentially) a chain reaction of eruptions of the other three units (reactors) at the Chernobyl station and the spent fuel storage, had the Unit 4 reactor eruption been more destructive (destroying adjacent reactors), or had the radiation release been greater from Unit 4, and thereby caused the reactor operators to evacuate the whole plant, leaving the other reactors unattended, and their cooling systems to then breakdown.

The Western reactors, particularly the Pressurized- and Boiling Water Reactors (PWRs and BWRs), are in many respects far more dangerous than the Chernobyl type reactor (pressure-tube, graphite reactor, called RBMK). The Pressurized Water Reactors and the Boiling Water Reactors employ a large steel pressure vessel for containing the nuclear fuel (the reactor core). These reactor pressure vessels have potentials for rupturing explosively, destroying the reactor containment building, and discharging the radioactive material into the environment/atmosphere with catastrophic consequences for the public. Also, the fuel mass in the PWRs and the BWRs is much more concentrated in a much smaller volume (the reactor vessel) than in the dispersed fuel configuration within the large-volume graphite block of the Soviet's RBMK reactor. This results in the potential for a more intensive fuel heat-up and radioactivity release in loss-of-coolant accidents (core meltdown) in the PWRs and BWRs, plus the associated catastrophic steam explosion potentials, due to sudden mixing of a concentrated, large coherent mass of molten fuel with a pool of water coolant lying at the bottom of the reactor vessel (or beneath the vessel, after the core melts through the vessel). Also,

the much larger reactor containment building used in PWRs can, upon over-pressurization in loss-of-cooling or core melting accidents, explode with much greater violence than the explosion that occurred at Chernobyl, and thereby result possibly in a near full radiation release and also the destruction of the adjacent reactors in multi-reactor power plants---a chain of multiple reactor eruptions. For example, the Graveline plant in France by the English Channel employs six reactors side by side! The radiation release of just one reactor eruption could require the abandonment of about 200,000 square kilometers of land, and ruin agriculture over a larger size area. Also, Western reactors have their own peculiar potentialities for runaway atomic chain reactions, besides other modes of reactor eruptions.

The fast neutron, plutonium breeder reactor, such as the Super-Phénix reactor in France and the SNR-300 in West Germany, is also dangerous. This type of reactor is being developed, in order to exploit the full nuclear energy potential of the uranium stocks and the high grade uranium ores. In the not too distant future 90% of the nuclear power reactors would be fast breeder reactors, if nuclear power were fully developed, according to official planning. However, this reactor type has catastrophic nuclear explosion potentials, by many different mechanisms, due to the high concentration of plutonium used in the fuel in the reactor core. Up to one million square kilometers of land could have to be abandoned, if such an explosion were to occur, due to the near total vaporization of the reactor core, and the consequent release of the radioactive fission products and plutonium, and their fallout contaminations. Moverover, recent research, which I have made, has led

to the discovery of atomic-bomb size explosion potentials, by a here-to-fore over-looked mechanism. The mechanism, which is similar to the Hiroshima atomic bomb mechanism, involves an explosion of one "critical" mass of compacted breeder fuel, which blasts a second mass of compacted fuel toward a third mass, creating a super-critical mass, as in an atomic bomb. (In a fast breeder reactor there is the potential for 12 to 15 separate "critical masses" forming by fuel compaction during a reactor core meltdown or disintegration accident.) One to three kiloton TNT-equivalent explosion potentials have been calculated (Hiroshima was 13 kilotons). As yet, no upper limit of the nuclear explosion potential has been determined, as the enormous energy release and pressures of say a one kiloton energy release could conceivably compact or compress momentarily other nuclear fuel material in the reactor, and thereby possibly cause still additional atomic reactions and energy releases, hence an even larger end-result explosion.

It is concluded that all nuclear power plants should be promptly shut down, and that the nations of the world should fully review and investigate the nuclear accident hazards, and, in parallel, fully investigate the practicality of alternative energy sources and ways of life, toward wisely resolving the nuclear energy issue. It is urged that a spirit of objectivity and cooperation be fostered, and that the issue be resolved by peaceful methods and rational discourse.

My analysis of the Chernobyl accident, including a comparative analysis of the accident hazards of the Western reactors, has already

been issued in report form under the title: "The Chernobyl Nuclear Accident: A Summary Analysis of its Cause and Consequences with a Comparative Analysis of the Accident Hazards of the Western Reactors", July 18/August 1/8. 1986. Extracts have been published by the British journal The Ecologist, Vol. 16, No. 4/5, 1986.* My report is being expanded, to include a critical analysis and evaluation of the Soviet's report on the accident and other official reports, and soon will be published in full as a separate book by the Wadebridge Ecological Center, publishers of The Ecologist, Worthyvale Manor Farm, Camelford, Cornwall PL32 9?7, England, Tel. 0840-212711.

* These Extracts contain an error concerning the estimate given in my report of the possible number of cancer deaths which might result from the Chernobyl accident---a number which I have concluded cannot be excluded. See the next issue of The Ecologist for the correction.

Lecture by Richard B. Webb given at the AAI Conference, Session on the Theme "The (Il)Legality of the Nuclear State," September 26, 1986, Vienna. (The essay below is the lecture given at the conference along with additions of the nature of elaborations.)

Democratic and Constitutional Principles Reviewed and Asserted

The safety of nuclears reactors is a question of personal judgment, that is, subjective judgment. Involved in the safety evaluations of the pro-nuclear establishment is a great variety of subjectivities. For examples: the perceived "acceptable risks" versus the perceived benefits of nuclear energy; the nuclear establishment's reliance on theoretical predictions of small, containable reactor damage potentials of selected reactor accident possibilities without experimental verification of theory (the use of so-called "engineering judgments" of the adequacy of theoretical analyses); judgments of remote probability of catastrophic accident possibilities, and so on. Therefore, the political judgment of the issue of nuclear "safety," as well as the issue of the necessity of nuclear power, most decisively depends on who decides, that is, on the particular set of persons who will make the policy decisions for a society. The gravity of the nuclear hazards--- the catastrophic accident hazards--- demands, therefore, a full review of the fundamental principles of human law and democratic government, to determine just who should decide the nuclear issue, in order to ensure that the issue is wisely resolved.

In America this means a review of the U.S. Constitution---the supreme Law of the Land--- and the question of the constitutionality (or unconstitutionality) of the Atomic Energy Act and related laws of the

U.S. Government that have served as the basis for the development of nuclear power in America as well as the promotion of nuclear power plants by the U.S. throughout the world. I find that the Atomic Energy Act and other related acts are unconstitutional: that the U.S. Government (the Congress) has no general power granted by or under the Constitution to promote industry, science, and technology, or other such power which might be construed as a general authority by which to promote and regulate nuclear energy. The purpose of the U.S. Constitution was to establish a government to manage a Confederation of otherwise sovereign States (New York, Virginia, Massachusetts, etc.), and not to govern a grand Nation, whose territory would encompass the States grouped altogether. More specifically, the U.S. Government was established by the Constitution to basically govern only the external affairs of the States (such as the affairs of war and peace, treaties, and commerce with foreign nations and between States), thereby reserving to the States individually the powers to govern their respective internal (domestic) affairs, such as industry, agriculture, science and technology (useful Arts), education, public health, public works, banking, corporations, roads, and so on, except for certain minor powers of general utility that were granted specifically to the federal (U.S.) Government by express declarations in the Constitution, such as concerning the postal system and copyrights and patents.

The basic democratic principles underlying the Constitution of the United States are as follows: The government is to be close to the people. The territory which the government is to govern is to be of a small extent---not an extensive territory--- and not too many

constituents per legislator. The government is not to be remote from the people---not to govern a grand size territory with huge numbers of citizens supposedly "represented" by a relative few powerful persons---not a grand nation where only a few persons acquire by means of accumulated wealth and schemes the power of government with command of the combined resources of a vast territory (enormous power), and where the people have no practical control of government---where the ordinary individual has no practical influence in the public policy making.

The U.S. Government has demonstrably violated the Constitution, and thus these principles, by assuming and exercising virtually complete power to govern the internal affairs of the States (and thus creating a super State), such as powers: To promote and regulate industry (nuclear power plants, for instance); To charter corporations, such as banks (for example the Federal Reserve Banks and the so-called national banks, and vesting these banks with power to create money---paper money and checking account money---in order to acquire the means (money) to promote the Government's unconstitutional projects and favored industries and interests at the expense of devaluing the people's money (inflation); whereas the Constitution declares that nothing but gold and silver coin shall be legal tender in payment of debt, to emphatically deny the Government any power to create money out of thin air); To over-ride State regulations of industry (such as when States have attempted to prevent the construction of a nuclear power plant or to prevent pollution from industries); To build jet ports, super-highways, and other public works; To grant the nuclear industry immunity from liability in the event of accidents; and so on ad infinitum.

Moreover, the U.S. Presidents (the Executive Branch of the U.S. Government) have violated and continue to violate the Constitution in the field of foreign affairs, by usurping the power to declare war (to make war), which is exclusively vested only in the Congress by the Constitution, and by making treaties, including alliances, without the concurrence of the Senate (the upper house of the Congress), whereas the Constitution expressly declares that the President is to have power to make treaties only by and with the advice and consent of the Senate, two thirds concurring. So, now we have the situation where one man assumes the power to make war, now nuclear war---an absolutely dangerous situation. The U.S. Constitution specifies that only the Congress has the power to declare war and only the Senate has the power to authorize a President to make a treaty of alliance. The reason for these constitutional provisions and limitations of presidential power was to disallow one person from having the power to order and take the country into war. Yet, the history of the United States is a history of presidential war-making, mainly from Presidents Wilson to Reagan, where the Presidents now assume in violation of the Constitution the virtually complete control of the foreign affairs powers of government. In the nuclear energy field, the five members of the "U.S. Nuclear Regulatory Commission", who issue licenses for "civilian" nuclear power plants, serve at the discretion of the President, according to the unconstitutional U.S. Government laws which created the U.S. Nuclear Regulatory Commission. Yet, the current President wants nuclear power plants partly for reasons of the "national defense," that is, to supply energy to maintain the present vast system of industry, in order to support the existing and expanding huge military power complex, and also

to produce extra plutonium for still more nuclear weapons. Thus, the U.S. Government's nuclear weapons policies, including any secret war plans of the President and other officers of the Executive Branch of the federal Government (Department of Defense and its Military Forces) to use nuclear weapons, are connected with the licensing of nuclear power plants, and hence the "official" judgments of reactor "safety", as the NRC commissioners are beholden to the President for their office.

The situation in America is thus a total breakdown/collapse of Constitutional Government. In reality the system of government now in effect in America is a corporate oligarchy with a monarchical-like operation-----a clever exploitation of the freedom of the individual and the otherwise democratic spirit of the people, but no real democracy. It is instead a government by the few, which has effected a highly industrialized and militaristic way of life, which the People have never said they wanted, as they never granted the federal Government the powers to effect it. It is a government with a history of recurring war and which is preparing for nuclear war.

It is this unconstitutional government in the United States which also has promoted nuclear power plants throughout the world (except, of course, the Eastern block, where nuclear power is also promoted by a super-State ---another huge central government over a vast territory). For instance, there is the unconstitutional U.S. Export/Import Bank. Also, the Western Europe's development of nuclear power plants is based on U.S. developed technology, brought about by unconstitutional acts.

Incidentally, 25% of the funding of the International Atomic Energy Agency is financed by unconstitutional U.S. subsidies (money grants).

To correct this unconstitutional, undemocratic crisis-of-government situation in America, one only needs to demonstrate, by analysis of the text of the Constitution and historical records, what the true meaning of the Constitution is, that is, what were the intentions of those who made the Constitution, and then to promote a movement for (restoring) constitutional government. For the People of America cherish their Constitution, their constitutional rights especially, and the principle that the powers of government are to be derived from their consent. It is merely that the People have been unmindful---that is, they have not paid attention to--- constitutional law; and the universities, who receive huge money grants unconstitutionally from the U.S. Government, and therefore are beholden to the U.S. Government, have been negligent in teaching the Constitution. (Constitutional law is not now a required course of instruction for academic degrees, whereas in the past it was.) The process of the usurpations by the federal Government was gradual, and consequently went largely unnoticed by the population: an evolution of step-by-step erroneous, arbitrary interpretations of clauses in the Constitution by the federal Government, when assuming more and more powers---interpretations made without reference to the intentions of the makers of the Constitiution as to the true (intended) meaning of the text of the Constitution with respect to the extent and limitations of federal Government and Presidential powers. So now, the people generally do not know and have not learned how the system of government is supposed to be under the Constitution, and the reasons and principles

behind it. By promoting a review of the Constitution, and of the principles and science of democratic government, therefore, it is believed that the people will recognize the source of their many public miseries, hazards, and despoilations of the quality of life, such as recurring wars, nuclear hazards, excessive industry and pollution, inflation and other economic hardships, unhappy living conditions and environments, and so on. With the knowledge of the usurpations and abuses of power by the U.S. Government, and by relating these abuses with the people's complaints and dissatisfactions about government and its *policies*, and about the conditions in America, as well as hard experiences, there will naturally develop the popular push to reform the present unconstitutional system of government, and establish that form or system of government which, in the opinion of the People, will most likely effect their safety and happiness.

The people could practically reassert their power to govern through their still-intact State Legislatures and State Governments (close to them); as the Constitution expressly provides that the States ultimately control the powers of the Federal Government, by reserving to the States the expressed power to amend the Constitution without any interference by the federal Government, by convening a federal Constitutional Convention. This process could be used to remedy the defects in the present defacto system of government. (The results of such a Constitutional Convention would then be submitted to the States for ratification or rejection.) By this process the meaning of the Constitution could be clarified, to restore to the States the powers which the federal government has usurped, and make any other changes in

the Constitution (the system of government and the distribution and safeguards of power) which the people may see fit.

The above analysis of principles of democratic government has positive implications for Europe with regard to the nuclear hazards (and also nuclear weaponry, pollution problems, etc.). For the people of each of the large Nations of Europe should also review their own constitutions, or fundamental laws, and systems of government. Clearly, it has been powerful central governments of large States (Nations), which command the entire resources of large territories and populations, that have developed nuclear power plants. Naturally, therefore, we should ask: Is too much power exercised (granted or assumed) by central (national) governments---governments who are too distant from the people, and who govern too many people over too large of a territory?

Should we not also review and reaffirm the principle that the Government ought to get its powers only from the People, by their Consent? Consider for instance, West Germany, which strongly develops nuclear energy, and has a strong central government. Though it is called a "federal Government" (Bundesregierung), this central government has by the Grundgesetz (Basic Law) many, if not essentially all, powers to govern the internal affairs of the Länder (something like States but more like provinces), including such fields as nuclear energy, industry and banks. This system of government in West Germany is not necessarily what the people of West Germany wanted; for the so-called "Occupation Forces" after the Second World War, including the U.S.Government forces, dictated a strong central government for West Germany, when the

Grundgesetz was being made---an unconstitutional U.S. Government forcing a strong central government on the people of West Germany. (This fact is documented.) It should be pointed out that the State of Bavaria voted "No" to the Grundgesetz, but then voted also "Yes" under obvious pressure. Incidentally, the West German parliament has recently passed, or is in the process of making, a law which prohibits in the future the individual States (Länder) from publishing information on radioactivity contaminations following a reactor accident and from issuing radiation protection regulations, so as to give the federal Government (Bundesregierung) total control of the public information and the degree of radiaton protection measures in the event of another (the next) nuclear accident.

Also, the reactor licensing process in West Germany appears to be ultimated controlled by the federal Government (Bundesregierung); although each Land government has a licensing role to play. The question arises: If a Land government should deny a reactor license (for example, if the Land of Nordrhein-Westfalen should decide not to grant a license for the SNR-300 fast breeder reactor to go into operation), could the Bundesregierung over-ride the Land decision and allow the reactor (e.g., the SNR-300) to operate? I have been informed that one legal expert in West Germany has determined that the Bundesregierung has authority under the Atomgesetz to appoint a "Commississar" to review a negative Land decision and reverse it---in effect, a federal Government ultimate power. Also, the Atomgesetz, which grants the nuclear licensing authority, was made by the federal Parliament, and can be amended by them. So, ultimately, the federal

Government in West Germany, evidently controls the nuclear licensing. The Grundgesetz does not reserve the ultimate decision power over nuclear licensing to the Länder. At least this is my understanding presently, which needs to be confirmed.

The British system of Government is clearly not founded on positive grants of power from the people, but instead on a series of laws and customs derived from a mixture of monarchical and aristocratic foundations and practices, and certain concessions to so-called popular demands---a haphazard arrangement, which has resulted in the present strong central government that governs over an extensive territory and population. (Yes, the members of the House of Commons are elected by the public. However, the point being made here is that the popular election of the legislators does not necessarily mean a democracy, if there are too many constituents for each legislator, and if the territory being governed with respect to domestic affairs is so large that the legislators could not possibly supervise the administration of government, because the government operations are so vast.) Consider too The Official Secrets Act. Consider also that one person in the British Government---a prime minister---can evidently make war and alliances (for the most recent example, the Prime Minister's permission for the U.S. to use bomber bases in England to attack Libya on April 14, 1986.).

And the system of government in France? And in the Soviet Union?....

It is recommended that the people of Europe give serious consideration to the democratic principles that the Government ought to get its powers from the consent of the People---that government ought to be close to the People, governing the internal affairs over not-too-large a teritory, with a federal system, if desired, to unite a number of States wishing to be confederated, in order to provide for their common defense and promote their general welfare (for example, pollution protection---a specific power granted to the central or federal government to regulate industry in any particular State in so far as to prevent pollution of other States in the confederation). As for the nuclear energy issue, it may not be capable of a sound resolution without a parallel review and reform of the systems of government in the major nuclear development countries. The nuclear energy issue cannot, in my opinion, be resolved in isolation; but most everything ----the way of life, regulations of corporations and industry, systems of government, defense policy, foreign relations, and so on---needs to be thoroughly reviewed, and the public policy of different societies be made on the basis of democractic, constitutional government. This process should be done peacefully and orderly with the rights of the individual respected. The object is the safety and happiness of all the people.

Writings of Richard E. Webb with respect to Constitutional Law:

"Who Should Decide?", a constitutional analysis and argument, chapter 13 of his book The Accident Hazards of Nuclear Power Plants;

"Treaty-Making and the President's Obligation to Seek the Advice and Consent of the Senate with Special Reference to the Vietnam Peace Negotiations," Ohio State Law Journal, Vol 31, No. 3 (1970);

"Sketch of a Constitutional Analysis: Who Should Decide? Recurrence to Constitutional Principles"---an unpublished manuscript which concentrates mostly on the domestic affairs powers usurpations of the U.S. Government;

"Presidential War-Making, Nuclear Weapons, and Unconstitutional Government", a draft book outline, detailed, 80 pages about;

Essay "U.S./Libya War Crisis: The United Nations Charter, and Constitution," April 20, 1986. See Appendix.

Postscript:

I do not contend that the present system of government in West Germany is fundamentally flawed, but only that we should review our systems of government, look for and decide on principles of democracy or good government, and above all, consider experience, and then draw conclusions about the wisdom or defects of a particular system presently in operation, and whether or not reforms or improvements are needed. What can be established presently is that the U.S. Government has violated the U.S. Constitution, and that evidence exists that the U.S. Government had dictated a strong central government for West Germany. I have not adequately studied the British system of government to comment on that system beyond what I have said about it earlier.

Also, I do not imply that because the nuclear development has occurred under unconstitutional government (U.S.), or under a central government of questionable foundations (Great Britain, the Soviet Union, and West Germany), nuclear energy must necessarily be bad. Obviously, nuclear energy must be evaluated on its own merits.

Continues with additional postscripts and an essay on "US-Libya War Crisis"— pages 13 - 17.

Postscript for Lecture:

Democractic and Constitutional Principles Reviewed and Asserted

By usurping the States' internal affairs powers, the U.S. Government violates also another fundamental democratic principle, namely the principle of equal representation of the people in the legislature. The Constitution, because it establishes a Confederation, divides the legislature into two houses---the Senate and the House of Representatives ---which together (co-jointly) have the power of making the federal laws. The members of the House of Representatives are apportioned equally among the population of the United States; as the House of Representatives is to provide the People a direct representation in the federal legislature (U.S. Congress), for the federal Government is given the powers by the Constitution to tax and conscript the individual citizen, and to enforce the federal laws direclty, rather than vesting the State governments with the powers of enforcing the federal laws and raising the federal revenues and armies. However, in keeping with the confederate nature of the Constitution, the members of the Senate are apportioned by the Constitution equally among the States, i.e., two votes (two Senators) for each State, large or small. In a confederation member States traditionally have equal votes.

Now, however, under the existing unconstitutional system of government, where the U.S. Government assumes the operation of a grand Nation---a grand national government---instead of staying within the bounds of the Constitutional Confederation, there becomes a gross disparity (inequality) in the representation of the People in the governing of the country,

particularly with respect to the domestic affairs. (The domestic affairs of a country are the most important affairs of the people; for they concern the ordinary course of their lives, their livelihoods, their homes, industry, environment, culture, education, health, and so on.) For a small populated State has the same number of votes in the Senate as a large State. Yet, the Senate controls the law making in the U.S. Congress co-equally with the House of Representatives, and the Senate alone, by the Constitution, controls the appointments of the federal Ministers and all other U.S. Government officers. Numerically, a mere nine percent (9%) of the population in America controls the U.S. Government legislation, through that group of the least populated States which holds a majority of seats in the Senate. (Incidentally, this majority group of least populated States generally receives a disproportionately large fraction of the U.S. military and defense related (e.g., research and development laboratories) expenditures, by my guess.) This gross inequality of representation is hardly a democracy, when viewed against the unconstitutional operations of the Federal Government over the internal (domestic) affairs of the States.

Richard E. Webb

Unpublished

Letter to the Editor — U.S./LIBYA WAR CRISIS: THE UNITED NATIONS CHARTER AND THE CONSTITUTION

I am a former naval officer (staff of Adm. H. Rickover) and author of published works on Constitutional Law and of a 1972 U.S. Senate Resolution to assert the Senate's constitutional authority over U.S. foreign relations. I've investigated both the questions of the legality with respect to the U.N. Charter and other pertinent Treaties which bind the United States, and the constitutionality of the United States' military incursions and attacks against the Nation of Libya and their claimed territorial waters of the Gulf of Sidra. This investigation has included discussions with the Ass't Legal Advisor, U.S. Dept. of State, in charge of the Law of the Sea Division, and the Ass't General Counsel for Internat'l Matters of the Dept. of Defense and other U.S. officials, and discussions with the Legal Advisor of the Libya Mission to the U.N., and with defense and foreign affairs experts in W. Germany. I've established that the command center for the U.S. attacks was in W. Germany (Hdqtrs. U.S. European Command), which raises questions of violations of the NATO treaty and W. Germany's sovereignty. Main conclusions:

1. Libya has solid support in internat'l law to claim the Gulf of Sidra as internal territorial waters, including specific articles in the 1958 Law of the Sea Convention, which the U.S. signed.

2. The U.S. disputes Libya's claim to the Gulf of Sidra, but cites no specific support in international law for its claim that the Gulf is "international waters."

3. The United States has violated the U.N. Charter, specifically Chapter 6 on "Pacific Settlement of Disputes," by entering the Gulf of Sidra on March 24 with warships and warplanes, supported by a huge armada of warships and warplanes just outside the Gulf, to enforce ("exercise") its claim of international waters in the Gulf--the threat and use of force--(a) without seeking "first of all" a peaceful settlement of the dispute by negotiation, enquiry, mediation, conciliation, conferences, arbitration, judicial settlement, or other peaceful means, as expressly required by Article 33, and (b) by not referring the said dispute to the U.N. Security Council for peaceful resolution, as is expressly required by Article 37.

4. The U.S. has made attacks, waged an unjust defensive war, and then subsequently an unjust offensive war, in violation of the Law of Nations and the U.N. Charter, since the U.S. did wrong in starting the war by initiating the threat and use of force to try to establish a right to navigate and practice naval warfare in the Gulf, instead of abiding by the dispute settlement procedures and principles of the U.N. Charter. The U.S. thus provoked, and continues to provoke, further and more widespread violence (counter-attacks), and terrorism throughout the world.

5. The President and other officers of the Executive Branch have demonstrably violated the U.S. Constitution by making war against Libya (and earlier against Lebanon forces and Grenada) without a declaration of war by the Congress, and by related acts of foreign affairs, e.g., sending envoys to seek ally support for the April 14 bombing attacks on Libya without the advice and consent of the Senate--two thirds concurrence required. Also, the Presidents have violated the Constitution by making treaties of alliances and assistance with Israel and Lebanon without the Senate's advice and consent (2/3), thus taking sides in the Middle East War and thereby provoking violence against the U.S. (the terrorisms) by the forces opposed to Israel.

The crisis is truly critical: a state of war exists: killing people: endangering other nations: close to a confrontation with the Soviet Union in the Mediterranean Sea: ominous first-use ever in warfare of ballistic missiles (SS-1's): the Administration now discusses "all-out attacks" and blockades and sanctions covert operations against Libya, and warns of further attacks: presidential power is out of control of the American people: possible larger war, even nuclear war! Hence, the urgent necessity to return to the principles of the Law of Nations, the U.N. Charter, and the Constitution, to guide the American people to get control of this crisis, to restore and cultivate Peace, and to shackle unconstitutional presidential war-making with a further view to the military confrontation in Europe, Nicaragua, escalating war in Afghanistan, and preventing nuclear war.

I am preparing a full treatise on this subject, which is based on full documentation, much of it supplied by the Depts of State and Defense. Freedom of Information Act requests have also been filed to get additional documents. A Quick Preview Report is available, as is a draft outline of a larger treatise, Presidential War-Making, Nuclear Weapons, and Unconstitutional Government. I propose an urgent conference among interested persons to discuss the details of the analysis, examine and analyze the documentary proofs, and make plans to pursue the matter, to promote the earliest possible peace. Signed: Richard E. Webb, Ph.D., Sylvania. Phone 882-6523. Need support.

April 20, 1986

Postscript on the Atom Law of West Germany

I have since studied the Atom Law of West Germany and have issued a number of analyses, comprising an analysis of the Atomgesetz and the Grundgesetz, the latter being the West German constitution. I conclude that the federal Government in Bonn does indeed have the legal power to override a Land Government decision in regard to reactor licensing. (Under the Atomgesetz each Land, such as Nordrhein-Westfalen or Bavaria, is vested with the atomic licensing authority for its territory in the first instance, and also the authority to oversee the operation of reactors after they are licensed, though both the licensing and oversight authorities are subject to supervision by the federal Government.) In the case of the Kalkar fast breeder reactor, for instance, the federal Government has the legal authority under the Atomgesetz and Grundgesetz to order the Nordrhein-Westfalen Government to issue a license to operate the SNR-300 reactor. However, each Land Government is vested with the power (and right) to consult experts (AtG,§20) in exercise of its authorities under the Atomgesetz, in order to reach responsible opinions. In the case of SNR-300, the Nordrhein-Westfalen Government has recently attempted to exercise this power to consult experts by announcing its intentions to commission a new investigation of the accident hazards of the SNR-300 reactor, including an investigation of my analyses and calculations of nuclear explosion hazards of the SNR-300 reactor; but the federal Government has ordered the Nordrhein-Westfalen Government not to make this investigation. The Nordrhein-Westfalen Government has disputed the legality of the federal Government's order, and so the issue has been taken to the federal Constitutional Court for adjudication. In my opinion the federal Government's order is contrary to the Atomgesetz, since the Atomgesetz clearly (expressly) confers to the Land government an unqualified power to consult experts. The efforts of the federal Government to prevent the Nordrhein-Westfalen Government to commission an investigation of the SNR-300 hazards represents, in my opinion, an attempt to usurp the lawful power of the Länder (to take power away from the Länder). This attempted usurpation is similar to the process of U.S. Government usurpations of the powers of the States in America which has occurred (and continues to occur) throughout the history of America.

Postscript on the British Constitution

I have since studied to a fair introductory extent the British constitution, or more accurately, constitutional law. Specifically, I have studied the books, "Constitutional and Administrative Law," de Smith (Ed. Street and Brazier), "The Law of the Constitution," by A. V. Dicey, and various Acts of Parliament, such as the Nuclear Installations Act, Health and Safety at Work Act, Local

Government Acts, and a few other related statutes. However, it is not possible at the present time to offer a commentary on the British constitutional law.

Postscript for my Essay on the U.S. and Libya War Crisis

I note that the U.S. Military has engaged in aerial warfare against Libyian military aircraft early this month (January 1989) off the coast of Libya. About twelve U.S. warplanes encountered two Libyian fighter-planes. According to news reports, the U.S. planes shot down the two Libyian planes. I have been told that one of the Libyian pilots was rescued but sufferred injuries. These hostilities are evidence of the continuing state of war between the U.S. and Libya, which is the subject of my April 20, 1986 essay. (Has the U.S. conducted "covert operations" against Libya since the April 14, 1986 bombing attacks? Is the January 1989 aerial warfare an open eruption of a secret, covert war?) Clearly, the necessity for the return to the principles of the United Nations Charter and the Constitution of the United States still exists.

However, there has been one very hopeful development: According to a radio report on January 19, President Reagan has on his last day of office rescinded the U.S. Government's ban on U.S. citizens conducting business in Libya (oil business). I hope this means the beginning of a state of peace between the United States and Libya.

January 23, 1989
Richard E. Webb

S4379

HINKLEY POINT

NUCLEAR ACCIDENT HAZARDS

by

Part 1 of 2 Parts

Dr. Richard E. Webb

The Advanced Cas-Cooled Reactors (AGRs) at the Hinkley Point nuclear power plant have real possibilities (potentials) for catastrohic nuclear explosion accidents, contrary to past public assurances of the Central Electricity Generation Board (CEGB) that the AGRs cannot explode like the Chernobyl eruption. Such an explosion could release into the atmosphere practically all of the deadly radioactive substances in the reactor as dust and vapors, and also destroy the adjacent AGR plus the two Magnox reactors in the plant, causing three more reactor eruptions -- a gigantic chain reaction. The consequences of such a nuclear explosion accident at Hinkley Point, or at any one of five other AGR sites in Britain (see map), could be catastrophic potentially for all of Britain, and much of the rest of Europe, due to human exposures to intense nuclear radiation from the radioactive dust fallout on the ground and contaminated air, water, and food.

For example, the radiation consequences of one AGR reactor eruption could cause abandonment of approximately 200,000 square kilometers of land (about the size of Great Britain) due to semi-permanent gamma radiation (like x-rays only stronger) and permanent plutonium dust (a lung cancer hazard), evacuation of pregnant women and procreation prohibitive for at least a year over one half to three million square kilometers, and ruin of agriculture over 750,000 square kilometers due to cesium-137 and strontium-90 radioactivity in the soil. A chain reaction of four reactor eruptions at the Heysham AGR plant near Manchester (4 AGRs) would multiply the consequences four-fold! (Or two and one half times for Hinkley Point, since the Magnox reactors are smaller than the AGRs in power output.) It is possible that about fifty million or more persons in Europe would die of cancer

caused by the radiation from such a nuclear catastrophe (there is a very large uncertainty in the harmful effects of radiation), not counting (a) the cesium-137 radiation in food, which is just as serious, (b) leukemia and bone cancer from strontium-90 also in food, and (c) an unpredictable number of lung cancer deaths over all time due to plutonium dust inhalation. There are other potential harmful consequences as well, including thyroid gland cancer from radioactive iodine, acute radiation sickness and death in the near of the reactor from very high radiation doses, and genetic harm to our off-spring and innumerable possibilities for health impairment. The social and economic disruptions in Europe would be even more terrible to contemplate -- a possible breakdown in social order, perhaps anarchy, war, and barbarism. The official "off-site emergency plans" for reactor accidents is really a colossal false confidence in the safety of nuclear reactors.

A nuclear explosion in an AGR reactor could occur as a result of a failure (loss) of electric power to the reactor coolant gas blowers followed by a failure of the automatic emergency reactor shutdown system to operate and promptly stop the atomic reaction. The continued high reactor power level with very little gas coolant flow through the reactor core would, by my calculations, cause the reactor core material to overheat and begin to melt in 30 to 40 seconds. The consequent disintegrating movements of the reactor fuel materials would affect the atomic reaction and could then immediately trigger a runaway atomic reaction and nuclear explosion. There are other AGR accident possibilities which also need to be analyzed. The details of my AGR hazards analysis are given in a treatise which I have submitted to the present Hinkley Point Public Inquiry in Cannington (Document No. S1986).

Under cross-examination in the Hinkley Inquiry the CEGB (Brian George, Day 54 and 72) has conceded the possibility of a runaway atomic reaction in the loss-of-flow accident, but beyond that CEGB refused to disclose their official AGR hazards analysis and also refused to release an internal memorandum which

evaluates my AGR treatise. A former senior scientist of the Aldermaston Atomic Weapons Research Laboratory here in Britain has studied this treatise and has written that my analysis "is correct." (Dr. H. Temperley, Inquiry document S2450)

All types of nuclear power reactors used in the world have catastrophic explosion hazards, not only the AGRs. This includes the Sizewell-B type Pressurized Water Reactor (PWR) being developed in Britain -- two such PWRs being built near London at the Sizewell site, and one or more planned for Hinkley Point, which is the subject of the present Inquiry in Cannington.

The Sizewell type PWR (a modified US/Westinghouse design) has many accident possibilities for runaway atomic reactions (power surges like Chernobyl only much worse) with potentials as severe as the AGR nuclear explosion potentials, and innumerable accident possibilities for fuel meltdowns and catastrohic steam explosions (like volcano eruptions where molten material mixes with water to generate explosive steam pressures). There are also possibilities for explosive rupture of the reactor vessel, and bursting of the reactor containment building upon over-pressurization. All have potentials for enormous explosions and release of practically all of the radioactivity of the reactor into the atmosphere -- far worse than the Chernobyl eruption.

The CEGB has contended that the likelihood or probability of such a catastrophic accident in a PWR is extremely low -- of the order of one in a billion years. Such "assessments" are mere guesses and assertions, however, and as such are wholly unrealiable. The Public needs to examine the engineering details, in order to really assess the risk or likelihood of accidents. For example, possibly the worst runaway atomic reaction can be caused by filling any one of four cooling water tanks with ordinary water instead of the required "borated" water, and opening one valve. A reactor core meltdown and catastrophic steam explosion can be caused by a rupture of a reactor

(Pages 3(a), 3(b), and 3(c) follow.)

cooling pipe with any two of three valves of the emergency reactor cooling system closed when the valves should be open. The Three Mile Island reactor (PWR) accident in the United States (1979) was caused by two closed valves. It was merely luck for the Northeast United States that the reactor did not explode in that accident (and destroy the adjacent reactor too); for we have since discovered that half of the reactor fuel had melted during the accident. A small fraction of the melted fuel could have produced a catastrophic steam explosion. In a small-scale experiment in the U.S. simulating fuel melting in a reactor no steam explosion occurred; but a second (repeat) test yielded a "spectacular" explosion that destroyed the facility. So steam explosions are "chance phenomena" -- they depend on haphazard and unpredictable processes of the interaction of molten fuel (5000 °F) and water.

As for the possible harmful consequences of reactor eruptions, the Public should know that the authorities in Britain, and in the other nuclear countries as well, are planning by their "risk assessments" to expose their populations to huge doses of radiation in the event of an accident. This, together with a number of arbitrary assumptions buried in their hazards analyses documents, such as assumed low fractions of radioactivity release, assumptions of light fallout of the dust (wide dispersal into the atmosphere), and unproven low estimates of the chance of cancer from radiation exposure, account for the fact that the CEGB estimates of the potential accident consequences are small in comparison with my estimates.

Also, the published industry analyses of the reactor accident hazards neglect to address and evaluate the most serious accident possibilities (these are simply ignored on the basis of personal judgments of low probabilities of occurence). For those accident possibilities which are analyzed in the official reports the industry makes unsound (arbitrary) and optimistic assumptions in their theoretical calculations of the reactor behavior in these accidents (for instance, regarding the explosive effects of a fuel meltdown) which result in predictions of low releases of radiation into the atmosphere or non-catastrophic explosions. I find that these predictions are unreliable because of the defects of theory and the total lack of reactor experiments. Full-scale reactor destructive experiments would be required to determine how much radiation would actually be released into the atmosphere in an accident and how severe the eruptions would actually be. Indeed, a few such experiments were recommended by the lead reactor laboratory in the U.S. in 1964, in order to at least establish basic eruption potentials of runaway atomic reactions and steam explosions; but these expert recommendations, which were made at the time when nuclear power development had just begun, were disregarded by the Government in favor of promoting nuclear power. Since we lack such experiments (a program of definitive experiments would be impractical anyway), we ought, therefore, to make the theoretical assumptions in our hazards evaluations which reveal the full potentials for reactor eruption, as my analyses endeavor to do, such as to assume the physical limit ("thermodynamic theory") potential for steam explosions in fuel meltdowns.* CEGB assumes a very small fraction of this potential in their hazards analyses based on defective small-scale, non-reactor experiments and defective analyses of these experiments. Moreover, a small fraction of the full potentials for reactor eruptions would be catastrophic, but I find anyway that the full potentials, or near full potentials are credible. I refer to my Hinkley Evidence for details.

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* See the footnote on the next page.

In effect the nuclear industry's reactor safety philosophy, which is supported by the government licensing authorities, is to try to avoid accidents by careful operation, but should accidents occur, to try to "manage" them to "mitigate" their consequences -- and learn the actual consequences of accidents by experience. It is all irrational and collosal risk taking. We should want to establish whetehr or not a particular accident possibility would be containable or limtied, by sound theoretical analyses and confirmatory experiments before we decide whether or not to operate reactors, instead of by experiencing accidents and taking our chances.

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(Resume on the next page.)

Footnote:

* For instance, the official hazards analyses have assumed a small leak in the reactor containment shell upon over-pressurization in an accident; whereas my limit-type theoretical calculations predict catastrophic explosion potentials. After my calculations were published in August 1984, in my report titled, "Catastrophic Nuclear Accident Hazards -- A Warning for Europe," a 1/8 scale model containment test was made in the U.S. which resulted in an explosion, contrary to official pre-experiment predictions of merely a leak, and the explosion violence was just as my calculations had predicted.

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Also, under cross-examination in the Hinkley Inquiry the Government (Nuclear Installations Inspectorate) would not exclude the possibility of several PWR reactors being built at Hinkley Point, not just one as commonly assumed. As many as four to six PWRs could be built at the site, as is typical in nuclear plants in France. As with AGRs there are possibilities for a gigantic chain reaction of reactor explosions in a multi-PWR plant, as well as an AGR nuclear explosion causing a PWR eruption(s) at Hinkley Point, and vice versa, a PWR eruption causing AGR eruptions. A PWR has roughly twice the radioactivity as an AGR, so the potential consequences of a PWR eruption is about twice that of an AGR.

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The Three Mile Island and Chernobyl accidents are warnings. But still there is a view emerging that although a 30 kilometer zone around Chernobyl has been abandoned (100,000 people), the accident shows that catastrophic accidents can be confined to a local area. However, this view is unjustified. (a) The Chernobyl eruption was small compared to AGR and PWR potentials (the Soviets estimate that only 3% of the radioactivity was released), and

the other three reactors on the site were fortunately not damaged.

(b) The full extent of the medical consequences and the radioactive fallout contamination in eastern Europe is not known in the West; and there are reports that the health injuries were far worse and over wider areas than officially reported, and reports of drastic increases in deformed births of farm animals.

(c) There is also the possibility of 700,000 cancer deaths resulting from the accident; and (d) Perhaps the worst of the radioactivity released travelled north to Sweden and Finland and beyond and fell out in areas away from the bulk of the European populations.

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(Page 6a follows.)

What to do? Firstly, I urge that my analyses of the nuclear accident hazards be studied. These analyses (in the form of treatises) have been submitted to the Hinkley Point Public Inquiry, and are all available to the Public free of charge as Inquiry documents. I refer specifically to my March 1989 Evidence (with errata and addendum) and to various other treatises which I have issued, and which are identified in the Evidence (see also Day 85 of the Transcript). My Evidence is supported by a meteorologist/physicist of the University of Innsbruck, Austria (see Day 84A).

Secondly, the Public could support my continued participation in the Hinkley Inquiry. A most important showdown debate on the crucial scientific and technical issues raised by my hazards analyses and by my critical evaluations of the industry analyses has been waged in the Inquiry (see my Evidence for detailed references to the Inquiry Transcripts). This debate continues with additional evidence which I am preparing plus a number of key questions arising from my Evidence that have been put to the CEGB and the National Radiological Protection Board by the Inspector of the Inquiry, Mr. Michael Barnes, and his Assessors. It is vitally important that I complete and submit to the Inquiry my evaluations of the informations and arguments given by the CEGB and other officials in this debate, and generally to complete my evidence. For this work I need financial support and assistance.

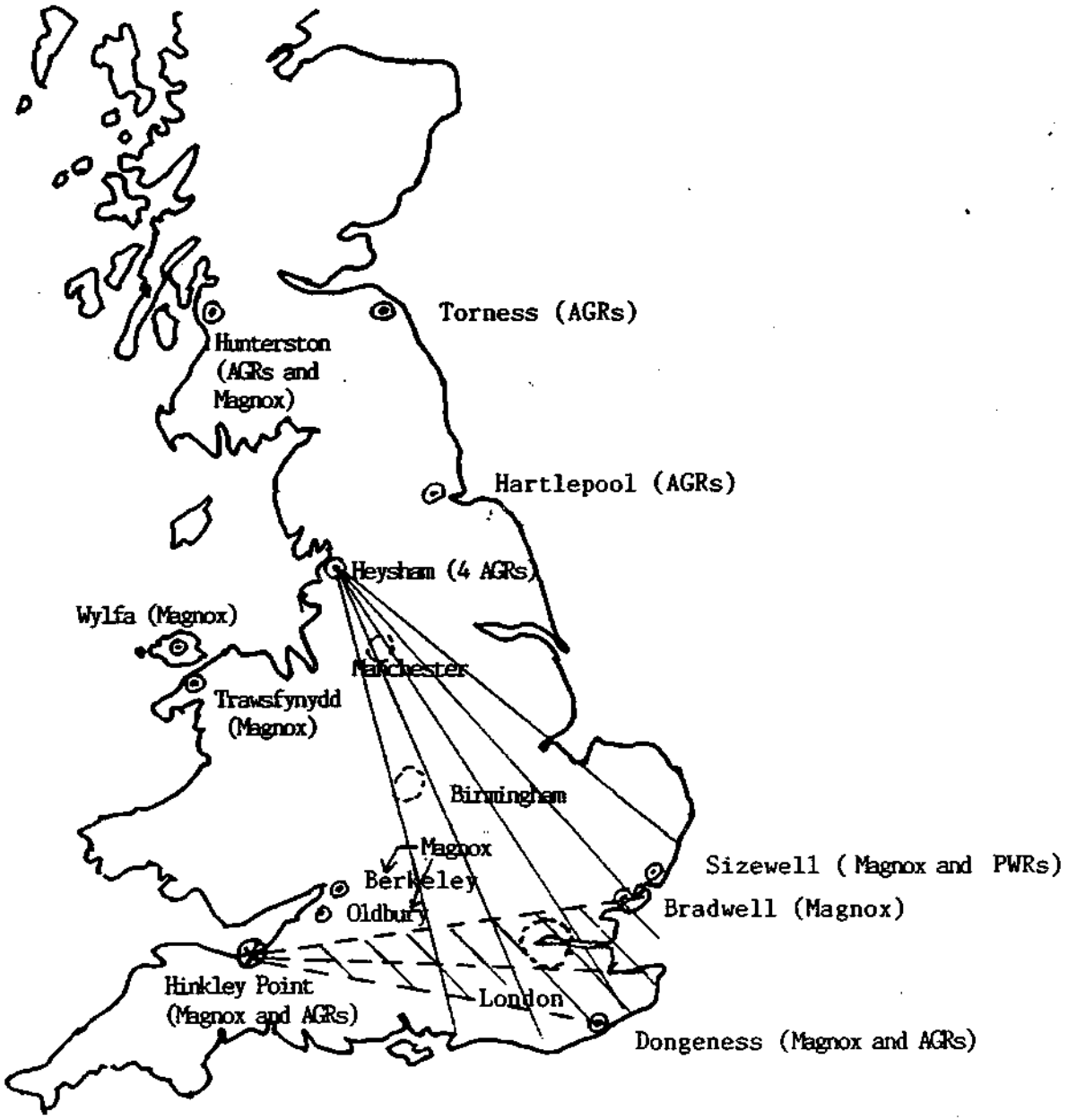
Thirdly, the Public should create one or more Scientific Commissions to fully investigate the nuclear accident hazards and my analyses of these hazards. This can be done through the national Government, but also through local government Authorities and through private initiatives. The present Hinkley

Inquiry is laying a basis for such a full investigation. However, since the present Inquiry is preoccupied mainly with the PWR question, a special Scientific Commission is needed immediately to fully investigate the AGR explosion hazards (and the hazards of the Magnox reactors also, as they are similar to the AGRs), because the AGRs (and the Magnox reactors) are in operation!

In my view all nuclear power plants should be carefully shut down immediately, while the needed full investigations and public review of the hazards of nuclear power are undertaken. I refer again to my Hinkley Evidence, and also to my August 1984 treatise, "Catastrophic Nuclear Accident Hazards -- a Warning for Europe," and my August 1986 treatise analysing the Chernobyl accident. Finally, there is the fundamental question: Who should decide the nuclear safety issue for society? For this I refer to my Hinkley Evidence, including my oral statements on Day 85, and my essay "Democratic and Constitutional Principles" (Inquiry document S2217).

June 29, 1989

Stogursey, somerset



(See Note for the Map.)

Great Britain

Nuclear Power Plant Sites in Great Britain

Note for the Map

Each Magnox station shown in the map has two Magnox reactors (18 total), and each AGR station has two AGRs, except the Heysham site, which has four AGRs. The power rating of a Magnox reactor is on the average about 30% of that of an AGR. The power rating of a PWR is about twice that of an AGR. The content of radioactivity in each reactor type is roughly proportional to the power level.

The wedge-shaped areas shown in the map emanating from the Hinkley Point and Heysham AGR sites depict possible areas of nuclear fallout from reactor explosions at those sites.* There are innumerable possibilities of the fallout distributions on land areas affecting Britain and Europe from such reactor accidents, depending on wind direction and speed, rain or no rain, rate of rainfall, and other atmospheric conditions, and also on the land terrain. The areas depicted represent one possibility of extremely intense concentration of radioactive fallout, where most of the radioactivity would fall out inside Britain, due to a moderate rain, which "washes out" the radioactive dust from the atmosphere. The average radiation levels in these areas could be about 50 times a criterion for abandoning land assumed in a U.S. Government study, and 66 times the plutonium limit for evacuating people that is assumed in the U.S. Military's Emergency Procedures Manual for nuclear weapon accidents which disperse plutonium from the nuclear warhead.

Less concentrated fallout distributions would affect much larger areas at still catastrophic levels, and consequently could affect much of the Continent of Europe.

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* Each segment represents one reactor eruption.

Biography of Dr. Richard E. Webb in Brief.

1. Doctorate in nuclear reactor physics and engineering, Ohio State University, 1972.

2. Engineer in the U.S. Atomic Energy Commission (1963-1967) with junior-level responsibility for the nuclear reactor part of the Shippingport Pressurized Water Reactor (PWR) -- the first civilian nuclear power plant in the United States and the original prototype PWR -- and other reactor experience.

3. Author of The Accident Hazards of Nuclear Power Plants, published by the University of Massachusetts Press, Amherst, Massachusetts (USA) in 1976, plus numerous other special works on reactor accident hazards (and constitutional law), including a treatise "Catastrophic Nuclear Accident Hazards -- A Warnig for Europe," which was issued in August 1984, before the Chernobyl accident, and a treatise analyzing the Chernobyl accident with a comparative analysis of the accident hazards of the Western reactors.

4. Gave evidence in the Hinkley Point C Public Inquiry (see Day 85) with a treatise "An Analysis and Evaluation of the Accident Hazards of, and the official Safety Arguments for, the Sizewell-B Pressurized Water Reactor proposed for the Hinkley Point Reactor Site in England, (preliminary report dated March 10, 1989). A full description of my background and qualifications is given in the Evidence.

5. I have been researching the accident hazards of nuclear power plants full time since 1970. I was an emergency advisor to the Pennsylvania Government during the Three Mile Island nuclear accident (near Harrisburg Pennsylvania). I gave technical advice on the method for cooling down the destroyed reactor core -- a critical matter. The method which I had advised was used. Audio tape recordings of telephone discussions with officials during the accident and of the radio

reports of the accident are available from me. A transcript of these recordings is being made and will be submitted to the Inquiry. I was also a member of the official West German Government study of the accident risks of the SNR-300 Fast Breeder Reactor.

I have come to Europe after the Chernobyl accident to further my efforts to promote a review of nuclear power hazards. My work in Europe has included research of the accident hazards of the British Gas-Cooled Reactors. I am independent and presently without financial support.

HINKLEY POINT

NUCLEAR ACCIDENT HAZARDS

by

Dr. Richard E. Webb

Part 2 of 2 Parts
(More In-Depth Version)

The Advanced Gas-Cooled Reactors (AGRs) at the Hinkley Point nuclear power station have real possibilities (potentials) for catastrophic nuclear explosion accidents, contrary to past official assurances of the Central Electricity Generation Board (CEGB) that the AGRs cannot explode like the Chernobyl eruption. The explosion potentials are enormous -- far worse than Chernobyl -- the equivalent of about 50,000 to 100,000 pounds of TNT, according to my preliminary calculations. Such an explosion of one of the two AGRs at the Hinkley Point "B" station would surely destroy the other adjacent AGR plus the two Magnox reactors next to the AGRs at the "A" station, thereby causing three more reactor eruptions--a gigantic chain reaction. Such eruptions would throw up many hundreds of tons of molten, burning, and vaporized reactor material (uranium dioxide fuel, steel, and graphite), thereby possibly releasing into the atmosphere practically all of the deadly radioactive substances in the reactor in the form of smoke, including the "long-lived" Cesium-137, Strontium-90, and Plutonium radioactivity -- an absolutely enormous quantity of radiation emitting material (dust particles and gases). The consequences of such a nuclear explosion accident at Hinkley Point, or at any one of five other AGR sites in Great Britain (see map), could be catastrophic potentially for all of Great Britain, and much of the rest of Europe, due to human exposures to intense nuclear radiation from the radioactive dust fallout on the ground and contaminated air, water, and food, covering vast geographically widespread areas.

A near full release into the atmosphere of radiation from just one AGR reactor potentially could result in:

(a) evacuation and semi-permanent abandonment of about 120,000 square kilometers of land (more than half the size of Great Britain) due to

"gamma" radiation alone from the nuclear fallout on the ground (gamma rays are like X-rays only much stronger);

(b) evacuation of pregnant women and procreation prohibited for at least a year over an area of about 500,000 square kilometers to three million square kilometers;

(c) permanent abandonment of 120,000 square kilometers because of plutonium dust fallout, which is a lung cancer hazard upon inhaling the dust (plutonium emits "alpha" radiation with a 24,000 year "half-life" -- the time it takes to decays to half of its intensity);

(d) ruin of food producing agriculture over 750,000 square kilometers for about 100 years due to Strontium-90 and Cesium-137 fallout contamination of the soil,* crop destruction (current crops) affecting two million square kilometers of land, and as yet determined effects of Plutonium dust on agriculture -- a permanent contaminant in the soil and farm dust inhalation hazard; and

(e) abandonment of 200,000 square kilometers or more due to all forms of radiation exposure combined.

A chain reaction of four reactor eruptions at the Heysham plant (4 AGRs) near Manchester would multiply these consequences four fold, and at Hinkley Point two and one half times (the Magnox reactors have smaller power outputs, hence less radioactivity). Also, the destruction of the on-site spent fuel storages might cause still more releases of radiation into the atmosphere. Also, it is possible that about fifty/to eighty million persons in Europe would die of cancer caused by the radiation from such a nuclear catastrophe (there is a very large uncertainty in the harmful effects of radiation), not counting (a) the Cesium-137 radiation in contaminated food, which is just as serious, but which I have not been able yet to sufficiently analyze, (b) leukemia and bone cancer from Strontium-90 also in the food, and (c) an unpredictable number of lung cancer deaths over all time due to plutonium dust inhalation.

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* Food grown on the contaminated soil would be contaminated with the Strontium and Cesium.

There are many other potential harmful consequences as well, such as thyroid gland cancer disease due to Iodine radioactivity, acute radiation sickness and early death in the vicinity of the reactors due to extremely intense radiation exposures, and indeterminable probabilities of genetic harm to our off-spring, and perhaps innumerable possibilities for health impairment besides cancer, which cannot be assessed (I think), and which could affect future generations through genetic damage. The social and economic disruptions in Europe would be even more horrible to contemplate -- a possible breakdown in social order, perhaps anarchy, war, and barbarism. The concept of "local emergency planning" for reactor accidents, as is being debated in the Hinkley Point Public Inquiry, therefore, is a colossal false confidence in the safety of the reactors. The Public must really inquire into and inform itself of the true extent of the nuclear accident hazards and the scientific uncertainties in estimating the hazards potentials.

An AGR reactor is a gigantic steel reinforced concrete pressure vessel containing a huge block of graphite with typically 332 vertical holes or "fuel channels." Each channel contains several bundles of "fuel rods." Each fuel rod is a stainless steel tube containing the uranium-dioxide nuclear fuel material for the atomic fission reaction. The atomic reaction heats the fuel rods; and the rods in turn heat the carbon dioxide gas "coolant" in the reactor, which circulates (flows) up through the fuel channels. The heated gas coolant (at 42 times atmospheric pressure and high temperature) is used to generate steam for the electric turbine by means of several water "boilers" housed inside the reactor vessel. The dense gas coolant is circulated through the reactor block by eight electric powered gas blowers. In an emergency the atomic reaction can be stopped by the reactor "shutdown system," which automatically drops "control rods" (non-fuel material) into the graphite block to quash the reaction. The radioactive material in the reactor is mainly the products of the atomic fission reaction, which build up in the fuel rods with reactor operation.

A nuclear explosion in an AGR could occur as a result of a common electrical failure causing a loss of electric power to the gas blowers, which is expected to occur from time to time, plus a failure of the automatic reactor shutdown system to actuate and drop the control rods into the reactor to stop the atomic reaction.* In this event the continued high reactor power level with very little flow of reactor coolant (no powered gas circulation) would result in rapid overheating of the fuel rods, and melting of its steel cladding in 30 to 40 seconds, according to my theoretical calculations. The subsequent drainage of molten steel away from the fuel material (pouring down the channels) would affect the atomic reaction, and potentially can cause a runaway reaction, which triggers the nuclear explosion process -- all within about 45 seconds from the initial electrical failure. The process is somewhat similar to that which caused the Chernobyl eruption, where the expulsion of boiling water coolant from the fuel channels in that reactor (also a graphite block), not molten steel drainage, caused a runaway atomic reaction. In an AGR accident the atomic runaway caused by the molten steel drainage can cause the fuel to melt and boil quickly. The expansion of the boiling fuel (froth) in the channels in turn would speed up the atomic reaction still more due to certain nuclear effects (which my calculations have discovered) to produce finally the nuclear explosion. The details of my AGR hazards analysis are given in a treatise which I have submitted to the Hinkley Point Public Inquiry in Cannington (Inquiry Document S1986). There are other AGR accident possibilities which need to be analyzed in detail as well.

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* A complete loss of electric power to the blowers of a Magnox reactor has recently occurred, and allegedly has also occurred at an AGR, though the Nuclear Installations Inspectorate (NII) has not confirmed this but has not adequately investigated the allegation either. Reactor shutdown system failures have occurred in a few instances at nuclear plants in America, but fortunately in minor disturbances which could still be controlled.

Under cross-examination in the Hinkley Point Inquiry, CEGB's Brian George has confirmed my calculations that the steel cladding of the AGR fuel rods would begin to melt in 30 to 40 seconds in a loss-of-flow accident, and that the clad melting could indeed result in a runaway atomic reaction, called a "reactivity accident." However, Mr. George would not comment on the significance of the runaway reaction -- that is, what it means in terms of triggerring a nuclear explosion -- and he refused to release a copy of CEGB's secret analysis of this loss-of-flow accident (Day 72, page 47). When pressed to address what the effect of a runaway reaction could be, Mr. George then contradicted his previous confirmatory statement about quick melting of the steel cladding by stating that "we believe" that the steel would not "actually" melt but instead would "oxidize" (corrode rapidly in the carbon dioxide gas), and thereby (somehow) remain with the fuel material in the channels (not drain away as could molten steel) so as to preclude the runaway atomic reaction. He qualified his remark, though, by stating that CEGB has "very limited experimental evidence" to support this new claim, and that the claim is "based on a limited amount of consultation with experts in the industry." However, he refused to disclose any details of the supposed experimental evidence, and would not agree to provide a written scientific analysis to the Inquiry to prove the claim.

I cannot evaluate CEGB's suddenly new claim that steel fuel cladding oxidation would prevent a nuclear explosion in an AGR accident without being able to study a written scientific analysis from CEGB that would propose to prove their claim. (Mr. George's bare statement of belief about oxidation of the steel cladding proves nothing.) But I can report that in May 1988 two scientists of CEGB's Berkeley Laboratory (Dr. John Young and Simon Board) confirmed in discussions with me that the steel cladding would melt in the AGR loss of flow accident and that this could cause a runaway atomic reaction. In these discussions Dr. Young and Mr. Board mentioned nothing about steel

oxidation; and they disclosed that no experiments have been made to investigate the behavior of the AGR fuel rods and its steel cladding in a loss-of-flow accident. (The discussions were arranged by Dr. John Wright, CEGB's chief of nuclear safety, to answer my questions about the AGR accident hazards, and are fully documented in my AGR report, S1986.) When I and the Inquiry Inspector, Mr. Michael Barnes, questioned Mr. George further about this matter, Mr. George then conceded that the physical possibility of a runaway atomic reaction occurring in such an accident by steel clad melting cannot be excluded. Also under cross-examination Mr. George revealed that one of CEGB's senior reactor physicist, Dr. John Young, who has represented the United Kingdom in the International Atomic Energy Agency's only post-Chernobyl conference on "reactivity accidents," has made a written evaluation of my AGR report (treatise); but Mr. George on behalf of the CEGB denied my request for a copy of Dr. Young's evaluation. In short, CEGB has given no proof that the AGRs have no catastrophic nuclear explosion hazards. I should add that a former senior principle scientific officer of the Aldermaston Atomic Weapons Laboratory here in Great Britain, Dr. H. Temperley, who was a group leader / (superintendent) in the theoretical physicsdivision there, has written that my analysis "is correct."

All types of nuclear power reactors used in the world have catastrophic explosion hazards, not just the AGRs.* Each type reactor has its own peculiar accident possibilities and mechanisms for eruption, including the Sizewell-B type Pressurized Water Reactor being developed in Great Britain -- two now being built near London and one or more planned for Hinkley Point, the latter being the subject of the present Public Inquiry in Cannington.

The Sizewell-B type pressurized water reactor (PWR) -- a modified US/Westinghouse design -- is a huge steel pressure vessel with about 50,000 twelve-feet long fuel rods all tightly bundled together to form the reactor "core." Water coolant at high temperature and high pressure (550 °F and 2250 psi) is

* There are about 86 reactors in France, West Germany, Belgium, Spain, and Sweden, besides 34 in Great Britain, and 60 more under contruction.

circulated through the reactor for removal of the atomic heat. The hot coolant is carried by pipes to heat exchangers for generating steam for the turbine electric generators. The whole reactor system is housed in a huge steel-reinforced concrete building (sealed), called the reactor "containment," which is designed to contain radioactive steam under pressure in the event of relatively minor accidents, such as a reactor coolant pipe rupture. (The AGR has no such reactor containment vessel.) An emergency reactor core cooling system is provided to cool the core with water in the event of a pipe rupture and loss of normal coolant. An emergency reactor shutdown system is also provided, which in concept is basically the same as that in the AGR, namely automatic insertion of control rods into the reactor.

The explosion accident possibilities for the PWR type reactor include:

(a) Runaway atomic reactions (reactor power surges, like what happened at Chernobyl). There are many such possibilities for the PWRs, which even after 35 years of reactor development still have not been evaluated; but the potential energy releases are as severe as the AGR nuclear explosion potentials or worse. To evaluate these accident possibilities would be a formidable task, due to the mathematical complexities involved; so I have not yet been able to make definitive evaluations, because of extremely limited financial resources. The nuclear laboratories should have made the evaluations, but have not, or have not published them.

(b) Steam explosions. An accident involving a loss of coolant (such as a pipe rupture) with a failure of emergency reactor cooling would cause a fuel meltdown. Subsequent mixing of molten fuel with water remaining in the reactor vessel could then produce a catastrophic steam explosion (a potential of about 50,000 pounds of TNT). The process is like the Mount St. Helen volcano eruption, and the miniature explosions one observes when drops of water fall into hot cooking

oil on a kitchen stove.

(c) Spontaneous explosive bursting of the reactor pressure vessel. In this event the hundred ton vessel closure head could be blown 1500 feet upwards, and the core with it.

(d) Over-pressurization and bursting of the reactor containment building. This would have the explosion potential equivalent to about fifteen World War II type "block-buster" bombs.

The CEGB has contended that the likelihood of a catastrophic reactor accident in a Sizewell-B type PWR is remote -- of the order of one in a billion years. Such official accident probability "assessments" are mere guesses and statements, and as such are wholly unrealiable. The Public needs to examine the engineering details, in order to really assess the likelihood of accidents. For examples:

(a) Possibly the worst potential runaway atomic reaction can occur as a result of two careless human acts (or sabotage): (1) filling any one of four emergency reactor cooling system water tanks with normal water instead of "borated water" (water with boric acid, used to control the atomic reaction), and (2) opening one valve associated with the faulty tank.

(b) A reactor core meltdown with a catastrophic steam explosion can be caused by virtually an infinite number of different ways (specific accident possibilities) involving combinations of possible component failures and human errors. One possibility is a simple rupture of one of the highly pressurized reactor coolant system pipes (due to a material or fabrication fault), which results in a rapid loss (blow out) of reactor water coolant, and any two of three valves of the emergency reactor cooling system being closed when they

should all be open. The valves in question are normally closed whenever the reactor is shut down; so the reactor operators always have to ensure that the valves are re-opened when starting up the reactor. The Three Mile Island reactor accident in 1979 in the United States was caused by two closed valves that should have been open.

(c) Also, a spontaneous rupture of any one of fifty high-pressure steel housings on top of the reactor, which contain the drive mechanisms for the reactor control rods, could cause a catastrophic runaway atomic reaction. Mechanistically, a rupture of one defective housing could trigger a rapid chain reaction or cascade of additional housing ruptures, as other control rod drive mechanism housings could also be defective and therefore on the verge of rupturing due to some common defect, resulting in several reactor control rods being blown out of the reactor core by the high reactor pressure -- a process which would produce a runaway atomic reaction.

There are a myriad of severe reactor accident possibilities (most of which the authorities have not analyzed), which leads me to conclude that a catastrophic accident is likely to occur in the not-to-distant future, or we ought to assume as much. As for the potential harmful consequences of reactor accidents, the Public should know that the authorities in Great Britain, and in other nuclear countries as well, are planning by their reactor accident risk assessments to expose their populations to huge doses of radiation in the event of an accident, including high levels of food and soil contamination by radioactivity. This, together with a number of arbitrary assumptions buried or implicit in their published accident hazards analyses, such as low percentages of the reactor inventory of radioactivity assumed to be released into the atmosphere, and unproven low estimates of the risk of cancer from radiation light fallout (very wide dispersal of the radioactivity*),

* in the atmosphere

exposure, account for the fact that the official CEGB estimates of the potential accident consequences (for example, in terms of the size land area requiring evacuation) are almost trivial in comparison with my estimates.* As the "health effects" of radiation at exposure levels below prompt lethality are extremely uncertain (but we know that radiation is harmful), the Public should intervene in the nuclear debate and take up and resolve the question of what should be the maximum tolerable doses of radiation for assessing the acceptability of the risks of reactor accidents, and require a full analysis of the accident potentials. We should do this now and not wait until an accident, when radiation would be all around us.

For a comprehensive analysis of the PWR and AGR accident hazards I refer to the Evidence and its Appendices which I have presented to the Hinkley Point "C" Public Inquiry.

The Public should also know that the Government does not exclude the possibility of several PWRs being built eventually at the Hinkley Point site, not just one. Conceivably, as many as four to six PWRs side by side could be built at Hinkley Point, in addition to the two AGRs and the two Magnox reactors already there -- all without any more public inquiries after the present Inquiry. In France there are several nuclear power plants with typically four and up to six PWRs at each plant. It could happen that a runaway atomic reaction and explosion occurring in one reactor would cause a rapid chain reaction of reactor explosions of all of the other reactors in these multi-reactor plants, which potentially could be ruinous for most of Europe and much beyond.

There is even the possibility of an atomic bomb size explosion occurring at a PWR upon a core meltdown (e.g., the planned PWR at Hinkley Point) -- a possibility which has not been ruled out scientifically, and which arises due to the large amount of plutonium (atomic bomb material) which accumulates in the fuel rods during reactor operation. No limit of the potential for such a nuclear explosion has yet to be calculated.

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* The potential catastrophic consequences of an eruption of a Sizewell-B type PWR reactor is about twice that of an AGR reactor, due to the much higher power

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Finally, there is the possibility that a multiple of reactor eruptions at one nuclear power plant (site) could indirectly cause multiple reactor eruptions at other nuclear power sites (more so for PWRs, which are larger than AGRs). Heavy radioactive fallout, including plutonium dust, in the area of a nuclear plant due to multiple reactor eruptions at another plant site in the same region of the country (say up to 200 miles distance) could conceivably cause the operating crew of the plant to flee the area with their families, leaving the reactor cooling systems unattended and therefore to break down.* Merely shutting down the reactors on a site would not render the reactors safe; for a reactor core continues to generate substantial heat even when the atomic fission reaction is shutdown, due to the extremely intense radiation in the fuel. Therefore, the fuel must be perpetually cooled by circulating coolant, to prevent a catastrophic meltdown and explosion, which requires electricity to power the elaborate cooling systems. At least this is the case for PWRs. Whether it holds true for AGRs remains to be investigated, as the official hazards analyses for the AGRs are kept secret. But the UK is embarking on a program to build PWRs. A possible social breakdown (panic) resulting from a set of reactor eruptions in a country could also cause a general failure of electrical supplies and consequently additional reactor eruptions at other sites. Also, if the reactors at other sites are kept operating despite a radiation catastrophe in the country, the general anxiety and disruption in supplies and personnel affecting a plant could then lead to carelessness and neglect that could result in a catastrophic reactor accident at the plant, and so on to other plants.

So, it is conceivable that a number of nuclear plants in Great Britain could erupt in a horrible, ultimate chain reaction of plant eruptions, possibly, or conceivably spreading to the reactor plants on the Continent -- a radioactive cataclysm. Clearly, we must fully evaluate the nuclear hazards.

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* The public may recall that the first sign in the Western World of the Chernobyl eruption came from radiation alarms inside a nuclear power plant in Sweden, due to workers walking into the plant from outside, carrying radioactive dust from the Chernobyl fallout on their shoes and clothes.

The Three Mile Island reactor accident in the United States (1979) and the Chernobyl accident in 1986 are warnings. After ten years we now learn that half of the Three Mile Island reactor core was molten for an undetermined period of time and with it the danger of a spontaneous catastrophic steam explosion, contrary to official assurances at the time that the public was not in danger. Only luck saved the northeast United States from a disastrous eruption (there was a second reactor on the site as well); for steam explosions are an unpredictable phenomenon. In a major laboratory experiment in the United States, a small mass of molten material simulating molten nuclear fuel of a reactor meltdown accident produced no steam explosion when dropped into a tank of water, but a repeat test resulted in a "spectacular" steam explosion that destroyed the experimental facility.

As for Chernobyl some now think that this accident shows that catastrophic reactor accidents can be contained locally without affecting geographically widespread areas. This view is not justified for the following reasons:

(a) The Soviets estimate that only about 3% of the radiation was released into the atmosphere in that accident; and the adjacent three reactors were fortunately not damaged. The eruption was therefore small compared to the reactor eruption potentials of the AGRs and the PWRs.

(b) A thirty kilometer zone has been abandoned, and over 100,000 persons were relocated.

(c) Chernobyl is about 3000 kilometes from Great Britain; and we really do not know the full medical consequences of the accident, and how seriously contaminated is the land in eastern Europe. I have been told about authoritative reports which indicate that the health injury consequences were far worse and over wider areas than what the earlier official reports have indicated. Drastic increases in the rate

of birth of deformed farm animals in the area near Chernobyl have been reported. Even our knowledge of the radioactivity contamination in western Europe is far from adequate, for instance, Bavaria in West Germany.

(d) There is the possibility of about 700,000 cancer deaths resulting from the accident based on projections of radiation doses which the European population will receive from the accident.

(e) Perhaps the worst of the radioactivity released by the accident travelled north to Sweden and beyond in the Artic, so that the worst of the radiation is away from the bulk of the European population, or the population of western Europe at least.

Clearly, if my analysis is right (and I am certain it is), we have an enormous urgent problem on our hands in Great Britain, the rest of Europe, North America, and Japan, where nuclear power is heavily developed. What to do?

First of all, I urge the Public, and especially those who have responsibilities for the health and safety of the Public, to inform yourselves of the details of my analyses of the nuclear reactor accident hazards, and of my professional qualifications to analyze the nuclear hazards. For this information I refer to the documents and hearing transcripts of the on-going Hinkley point "C" Public Inquiry. (This material is available to the public free of charge.) I have been participating in the Inquiry as a way to submit my analyses of the nuclear hazards to a formal governmental process for debate and investigation, to engage the nuclear industry and licensing authorities in a public debate on the nuclear accident hazards -- in particular my analyses as well as the official analyses of the accident hazards of the AGRs and PWRs -- to question the authorities (CEGB, the Nuclear Installations Inspectorate, and the National Radiological Protection Board) and try to establish the facts for the record, and hopefully to persuade the Inspector

to create, or to recommend the creation of, an independent Scientific Commission to fully investigate the nuclear accident hazards, using my analyses and the record of the Inquiry as a basis for such an investigation.

I refer specifically to my written Evidence which I submitted to the Hinkley Inquiry on March 16, 1989, which includes an errata and addendum, and to various treatises on the PWR and AGR reactor accident hazards which I have issued and which are identified in my Evidence and available as inquiry documents. (See Day 85 of the Transcript for my appearance, and Day 84A for the supporting evidence of Dr. I. Vergeiner of the University of Innsbruck in Austria.)

Secondly, the Public could support my continued participation in the Hinkley Point Public Inquiry, as my work is greatly impeded for lack of financial support, assistance, and facilities. My March 16 Evidence, though over one hundred pages, is still only a "preliminary report," and does not contain my full analysis of the Sizewell-B PWR accident hazards, nor my full critical evaluation of the hazards analyses of the CEGB, the National Radiological Board (NRPB), and the Nuclear Installations Inspectorate (NII). This work needs to be finished and a full treatise written up to submit to the Inquiry and published. Also, the matters which are treated in my analyses have been extensively debated in the Inquiry during my cross-examinations of various officials of the CEGB, the NII, and the NRPB, and in CEGB's cross-examination of my Evidence. I need to issue a written detailed analysis of this debate, to demonstrate to the Inspector and his Assessors (and to the Public) how the facts established by the cross-examinations support my analyses of the reactor accident hazards. Also, the nuclear officials have revealed vitally important technical information in the Inquiry as a result of my requests for information, for example, heretofore unpublished details of steam explosion research at the Winfrith laboratory of the United Kingdom

Atomic Energy Authority. I need to critically evaluate this newly disclosed information, which requires physics analyses and calculations, and writing up the evaluations in report form. The Inspector and his Assessors have also recently presented the CEGB and the NRPB with a number of technical/scientific questions arising out of my Evidence -- for examples, on steam explosion research and on the issue of the possibility or impossibility of an atomic bomb size explosion in an accident in the Sizewell-B type PWR reactor. I need to evaluate the answers which the CEGB and the NRPB give (and also to evaluate the questions), and submit my written evaluations to the Inspector.

There is also the issue of the magnitude of the risk or probability of fatal cancer due to radiation exposure which needs to be investigated in the Inquiry, as this issue bears heavily on the question of the potential harmful consequences of reactor accidents. I have made a thorough but not yet completed analysis of the statistics of cancer mortality among radiation workers and the Japanese atomic bomb survivors -- a rigorous mathematical analysis -- which indicates that the probability of fatal cancer per unit of radiation exposure (dose) is likely to be fifty times the official estimate. I need to finish this analysis and a treatise on the subject to submit to the Inquiry. This matter was debated in the Inquiry, and the results, which I believe support my analysis, need to be incorporated in my final Treatise and submitted to the Inquiry. Indeed, the Inspector has requested the NRPB (the National Radiological Protection Board) to give its views on my point that a cancer risk factor of 50 times the official assumption/estimate cannot be excluded. I will need to evaluate the NRPB's answer.

In short, an extremely important technical and scientific debate is going on presently in the Inquiry between the CEGB, the NRPB, and myself involving a large number of important details which are crucial to evaluating the reactor accident hazards and risks; and, therefore, it is vital that I have the resources to be able to carry on this showdown debate/investigation and

present my written analyses and evaluations on various key matters (proofs) to the Inspector and his Assessors (and to publish these works as well). We cannot expect the Inspector to be able to make a sound decision on the safety issue without presenting him with a sound analysis of the accident hazards -- one which adequately treats all essential matters.

As noted earlier the serious possibilities for runaway atomic reactions ("reactivity accidents") in the Pressurized Water Reactor (PWR), such as Sizewell B and Hinkley Point C, have not been evaluated. To make the evaluations would be a formidable scientific project of mathematical calculation. I at least have made such calculations for the AGR (which consumed one year of work); but these calculations are still preliminary and as such are not yet completed. I need to complete the work, to obtain the final results, and then write up a treatise which derives all of the theory and presents all of the calculations -- in short, a full proof of the results. This planned treatise is absolutely essential for a scientific investigation of the reactor accident hazards; otherwise nothing would be proved and the nuclear debate would remain merely an exchange of opinion. I had managed to find financial support (from Greenpeace UK) to undertake the most essential calculations of my AGR explosion hazards analysis; but unfortunately this support was stopped just when I obtained definitive results but before I could complete the work. I have written a detailed report of this AGR research but it is short of the required treatise (full mathematical proof). This report is Document No. 1986 of the Hinkley Point Public Inquiry. I believe that this report demonstrates the necessity to finish the analysis and calculations and issue a full treatise on the nuclear explosion hazards of the Advanced Gas-Cooled Reactors (AGRs). The Public would do well to ensure that this work is completed.

Thirdly, an independent Scientific Commission should be created to fully

investigate the accident hazards of the nuclear power plants operating and being built and planned in Great Britain, and the manifold analyses and evaluations which I have submitted to the Hinkley Point Inquiry and plan to submit. Indeed the Public would do well to create a number of independent Scientific Commissions well diffused in society to review the reports and documents of a main Commission.

The Inspector of the present Inquiry, Mr. Barnes, and his Staff have so far conducted a very productive and responsible inquiry; but with all due respect I believe that the Inspector (being a lawyer/not a reactor scientist) is not qualified to make an adequate, full scientific investigation; nor should one person be relied on to investigate and judge the many scientific issues of reactor accident hazards. A special Scientific Commission or commissions is/are needed to devote full time to making a full and urgent investigation, as well as to make competent investigations of the manifold detailed matters which are involved in a full hazards evaluation. In the present Inquiry the Inspector is inundated with a great multitude of information (statements, reports, and documents) which is not relevant to evaluating the reactor accident hazards, such as topics on economics, emergency planning, nuclear waste discharges, and so on, which greatly detracts from the time available to the Inquiry to make investigations of the reactor accident hazards. A Scientific Commission would be charged with developing a definitive analysis of the nuclear accident hazards -- a most formidable undertaking.

Hopefully, the Hinkley Point Public Inquiry will make a more in-depth investigation into my analyses of the reactor accident hazards, and recommend a full investigation by a competent Scientific Commission.* The present Public Inquiry is the only prospect for such action coming from within the national Government -- the Nuclear Installations Inspectorate already having indicated its inclination to license the PWRs and having shown no inclination to seriously review the AGR and PWR accident hazards. However,

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* The present Inquiry could lay a sound basis for the proposed full scientific investigation.

the Public can also turn to their local Government authorities for possible support for the work and investigations which I urge be done. Perhaps the local Government authorities have powers to sponsor investigations into the nuclear accident hazards, including my work in connection with the Hinkley Point Public Inquiry and the proposed Scientific Commission. Although under the present British Constitutional Law only the National Government has the power over the licensing of nuclear power plants in Great Britain, the reports and scientific treatises of a competent and independent Scientific Commission (to investigate the nuclear accident hazards) which a local Government authority or consortium of local authorities might sponsor would have a most powerful positive influence in nuclear regulatory decisions and nuclear power policy making of the National Government; for sound scientific analyses cannot be refuted and could not be ignored.

A number of local government authorities in the vicinity of the Hinkley Point plant have intervened in the CEGB's application for consent for a PWR station at Hinkley Point, by forming the Consortium of Opposing Local Authorities (COLA), which has called for and participates in the present Public Inquiry as the principle objectors to the proposed PWR station. Perhaps COLA could be a mechanism by which the Public could ensure the completion of my works regarding the accident hazards of the AGRs and the Sizewell-B/Hinkley Point C PWR (in connection with the Hinkley Inquiry) and the creation and support of the proposed independent Scientific Commission. So far COLA has not been disposed to support my works in connection with the Inquiry nor my various requests in the Inquiry for technical information from the CEGB and the UK Atomic Energy Authority. But hopefully a serious review by COLA directors and administrators and the Public of my Evidence and appendices given to the Inquiry, and the evidence given by Professor Dr. I. Vergeiner of the University of Innsbruck in Austria (meteorologist/physicist), which supports my analyses of the potential accident consequences, would induce COLA to support this work. I should

add that I find COLA's case on the reactor safety topic and its supporting evidence unsubstantial. Since COLA represents the People in the Hinkley Inquiry, it would be most responsible for COLA to try to use its position and powers to secure a full investigation into my analyses of the nuclear accident hazards, and to ensure that my analyses and evaluations are completed and my treatises finished, and also published, to promote a wider review by the scientific community and the public. The participating local Government authorities would be wise to support COLA for this, or to create a separate organization or consortium for this purpose.

Also, the Public need not rely entirely on governmental action and Commissions to bring about the creation of a Scientific Commission to investigate the nuclear accident hazards, or to ensure support for my remaining work in connection with the present Hinkley Inquiry. For there is always the right of citizens to take private initiatives and create and fund a foundation from which to support needed works for the public safety. In this regard I caution the Public not to rely solely on established general environmental "campaign" organizations to promote a full competent review of the nuclear reactor accident hazards. There is no substitute for democratic governemnt and direct private initiatives to ensure the health and safety of the public. In the end the People must take care to ensure their safety, by working through democratic government operations (and politics), and not expect that a few persons of a private campaign organization can do it for them.

Finally, there is the fundamental question: Who should decide the nuclear safety issue for society? Who should make the judgments about "acceptable risk?" Who should decide whether or not the nuclear power plants should be allowed to operate? The profundity of the magnitude of the nuclear accident hazards demands, I think, that the People review their system of Government, toward ensuring a sound decision making process for society. I refer to an

essay on "Democratic and Constitutional Principles" which I have submitted to the Inquiry for perspectives on Unites States constitutional law with respect to nuclear energy (Inquiry document S2217).

According to my study of the Statutes of Great Britain which pertain to nuclear power, no minister in government, nor the CEGB, is actually charged with the responsibility to ensure the public safety with respect to nuclear reactor accident hazards. This point was confirmed on Day 59 of the Hinkley Inquiry by my cross-examination of the Health and Safety Executive, Mr. Rimington, who conceded that though he has the authority (the power) to grant or revoke reactor licenses, he has not the legal or statutory responsibility to ensure the public safety. The official literature of the Health and Safety Executive states that the CEGB has the "absolute responsibility" for the safety of their reactors; but apparently this is not true, for the Statutes do not assign any such absolute or complete responsibility to the CEGB, but instead the Statutes expressly limit the responsibility to a relatively small financial liability -- a very limited liability. So the Public needs to address the problem of responsibility with respect to nuclear power plants and their accident hazards, as surely the responsibility to ensure the public safety ought to be definitely assigned.

In my view the government policy to operate and promote nuclear power plants should be fully reviewed by society. There is also the matter of the responsibility for the safety of the peoples of foreign countries in regard to the operation of UK reactors and conversely the responsibility for the safety of the people of the UK in regard to the operation of the reactors in France, West Germany, and other countries in Europe.

In my view all nuclear power plants should be shut down immediately, while the needed full investigation and review of nuclear power is undertaken. But even this may be dangerous; for electricity is needed for maintaining reactor cooling, as mentioned before. So an ordered shutdown would be

necessary to arrange for and ensure essential supplies of electricity for post-shutdown reactor cooling. We are truly in an extremely difficult predicament in regards to nuclear power plants. The way out of our predicament is first of all to investigate the nuclear hazards and establish the facts, and to promote a full review of the nuclear accident hazards by other nuclear countries as well.

June 16, 1989

Stogursey, Somerset
England

Background of Richard E. Webb (with respect to nuclear reactor physics and engineering)

--- Ph.D. Nuclear Reactor Physics and Engineering, Ohio State University, 1972; B.S. Engineering Physics, University of Toledo (Ohio), 1962.

--- Certificate, Reactor Engineering School, U.S. ATomic Energy Commission's Bettis Atomic Power Laboratory operated by Westinghouse Corp., Pittsburg, Pennsylvania, 1965.

---Division of Naval Reactors (Manager was Vice-Admiral H.G. Rickover), U.S. Atomic Energy Commission, 1963-67, as junior engineer responsble for the reactor part of the Shippingport Pressurized Water Reactor---the first civilian nuclear power plant in the United States, and the prototype of the PWRs now in operation in the United States and western Europe.

--- Designated reactor engineer at the Big Rock Point Boiling water Reactor in Michigan 1967-1968; resigned, in order to research the accident hazards of nuclear power plants.

--- Author of:

(1) The Accident Hazards of Nuclear Power Plants (University of Massachusetts Press, 1976);

(2) "An Analysis of the Three Mile Island Accident," Nuclear Lessons (Stackpole Books, Harrisburg, Pennsylvania, 1980);

(3) Catastrophic Nuclear Accident Hazards--A Warning for Europe, August 1984 (*)

(4) The Chernobyl Nuclear Accident: Its Cause and Consequences, with a Comparative Analysis of the Accident Hazards of Western Reactors, July 18, 1986/revised August 1, 1986, plus an Addendum on the First Medical Reports of the Accident, August 8, 1986 (*) (A revised, expanded version of this report will be published by the Wadebridge Ecological Center, Worthyvale Manor Farm, Camelford, Cornwall PL32 9TT, England; Tel. 0840-212711)

(5) Numerous special topic treatises and reports

--- Participated in the West German Government official study of the accident risks of the SNR-300 fast breeder reactor: SNR-300 Risikoorientierte Analyse, 1981-1982;

--- Independent researcher and consultant: Studies of Nuclear Hazards and Constitutional Law.

--- Currently residing in Europe: present address: c/o The Ecologist, Worthyvale Manor Farm, Camelford, Cornwall PL32 9TT; tel. 0044-840- 212711.

* These treatises are available in the German language through the Bundesverband Burgerinitiativen Umweltschutz, Friedrich-Ebert-Allee 120, 5300 Bonn 1. Tel. (49) 0228-233099